Chapter 4 Functions

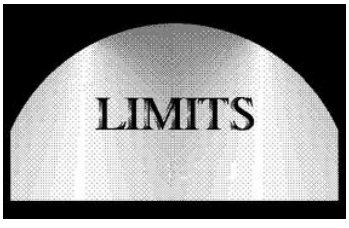
4.4 Comparing Linear & Nonlinear Functions

Unit Question:

How do we function within the limits we have?

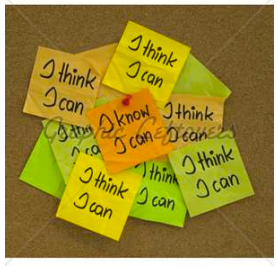
Learner Profile: Communicator

Area of Interaction: Environments



I Can Statement:

I can recognize when a pattern is linear or nonlinear.



Think, Pair, Share

Define nonlinear in your own words and give an example of a nonlinear function.

The graph of a linear function shows constant rate of change. A nonlinear function does not have a constant rate of change. So, its graph is not a line.

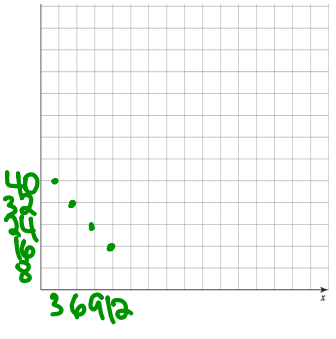
Does the table represent a linear or nonlinear function?

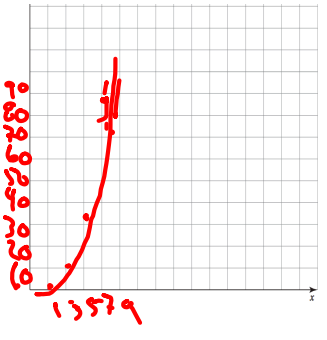
$\frac{40-32}{3-6}$ $\frac{8}{-3}$ $\frac{44-16}{9-12}$

x	3	6	9	12
y	40	32	24	16

x	1	3	5	7
y	2	11	33	88

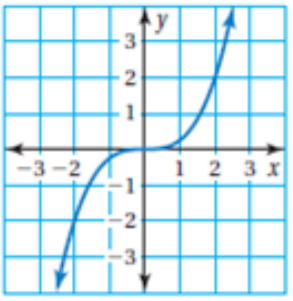
$y=-\frac{8}{3}x+48$



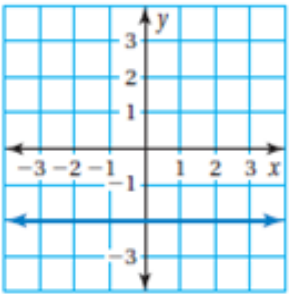


Does the graph represent a *linear* or *nonlinear* function? Explain.

a.



b.



Practice:

Does the table or graph represent a *linear* or *nonlinear* function? Explain.

1.

x	y
0	25
7	20
14	15
21	10

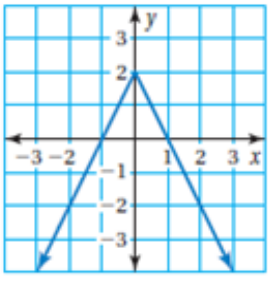
$m = -\frac{5}{7}$ Linear

2.

x	y
2	8
4	4
6	0
8	−4

$m = 2$ Linear

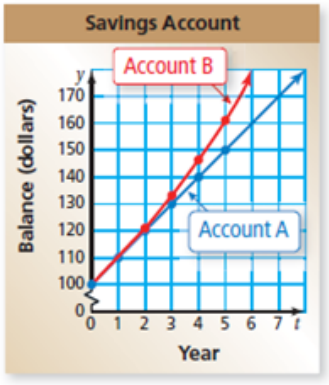
3.



Real-Life Application

Account A earns simple interest. Account B earns compound interest. The table shows the balances for 5 years. Graph the data and compare the graphs.

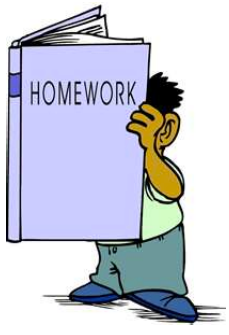
Year, t	Account A Balance	Account B Balance
0	$100	$100
1	$110	$110
2	$120	$121
3	$130	$133.10
4	$140	$146.41
5	$150	$161.05



The balance of Account A has a constant rate of change of $10. So, the function representing the balance of Account A is linear.

The balance of Account B increases by different amounts each year. Because the rate of change is not constant, the function representing the balance of Account B is nonlinear.

Assignment:



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